# ● PRINTER RUSH ●
## (PTO ASSISTANCE)

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| **Application :** 09/742.421 | **Examiner :** Bocure | **GAU :** 2631 |
| **From:** MR | **Location:** (IDC) FMF FDC | **Date:** 04-04-05 |

**Tracking #:** 0608136     **Week Date:** 12-06-04

| DOC CODE | DOC DATE | MISCELLANEOUS |
|---|---|---|
| ☐ 1449 | _____ | ☑ Continuing Data |
| ☐ IDS | _____ | ☐ Foreign Priority |
| ☐ CLM | _____ | ☐ Document Legibility |
| ☐ IIFW | _____ | ☐ Fees |
| ☐ SRFW | _____ | ☐ Other |
| ☐ DRW | _____ | |
| ☐ OATH | _____ | |
| ☐ 312 | _____ | |
| ☑ SPEC | _____ | |

**[RUSH] MESSAGE:** ① Parts of text /specification are illegible, especially the ones that have hold-up / hold-down dates. Please provide clearer copies.
② Provisional applications 60/171,604 and 60/243,727 are listed in palm sheet, but not in specification.

Thank you,
MR

**[XRUSH] RESPONSE** ① Use ~~spec first~~ spec dated 12/22/00

② Corrected.

**INITIALS:** DS

NOTE: This form will be included as part of the official USPTO record, with the Response document coded as XRUSH.
REV 10/04

09/742,421

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# INTERFERENCE SUPPRESSION IN CDMA SYSTEMS
## DESCRIPTION

TECHNICAL FIELD:

The invention relates to Code-Division Multiple Access (CDMA) communications

5 systems, which may be terrestrial or satellite systems, and in particular to interference

suppression in CDMA communications systems.

BACKGROUND ART:

Code-Division Multiple Access communications systems are well known. For a

10 general discussion of such systems, the reader is directed to a paper entitled "Multiuser

Detection for CDMA Systems" by Duel-Hallen, Holtzman and Zvonar, *IEEE Personal

Communications*, pp. 46-58, April 1995.

In CDMA systems, the signals from different users all use the same bandwidth,

so each user's signal constitutes noise or interference for the other users. On the uplink

15 (transmissions from the mobiles) the interference is mainly that from other transmitting

mobiles. Power control attempts to maintain the received powers at values that balance

the interference observed by the various mobiles, but, in many cases, cannot deal

satisfactorily with excessive interference. Where mobiles with different transmission

rates are supported within the same cells, the high-rate mobiles manifest strong

20 interference to the low-rate mobiles. On the downlink (transmission towards the

mobiles) transmissions from base-stations of other cells as well as strong interference

from the same base-station to other mobiles may result in strong interference to the

intended signal. Downlink power control may be imprecise or absent altogether. In all

these so called near-far problem cases, the transmission quality can be improved, or the

25 transmitted power reduced, by reducing the interference. In turn, for the same

transmission quality, the number of calls supported within the cell may be increased,

resulting in improved spectrum utilization.

Power control is presently used to minimize the near-far problem, but with

limited success. It requires a large number of power control updates, typically 800 times

30 per second, to reduce the power mismatch between the lower-rate and higher-rate users.

It is desirable to reduce the number of communications involved in such power control

systems, since they constitute overhead and reduce overall transmission efficiencies.

Nevertheless, it is expected that future CDMA applications will require even tighter

This application claims benefit of provisional appln
60/171,604 10/23/99 and provisional appln
60/243,097 10/30/2000